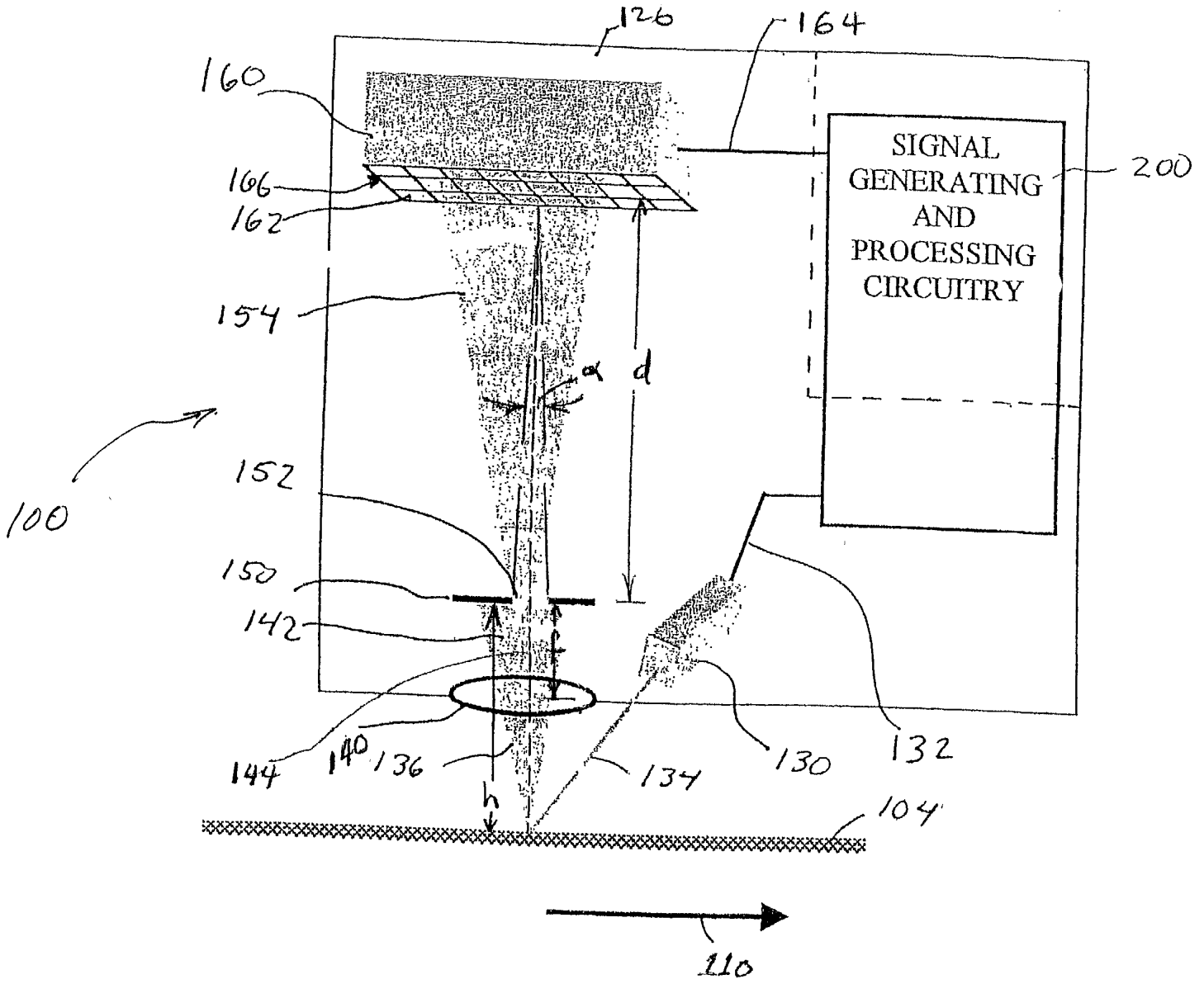
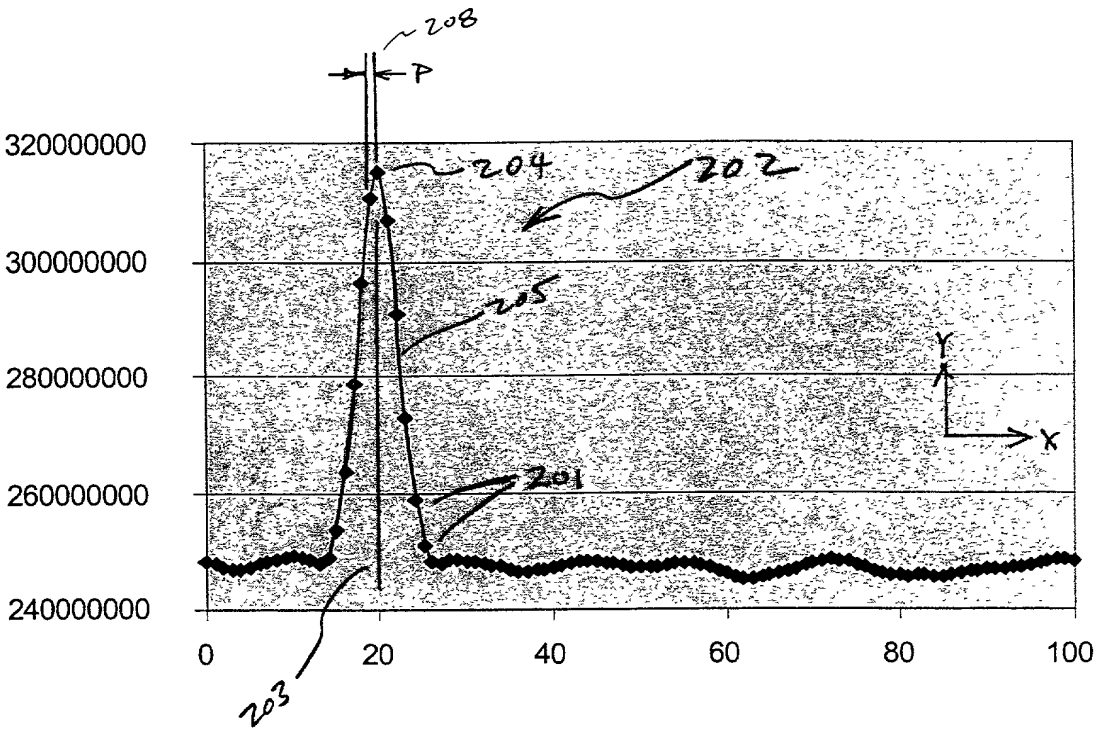

126
164
160
166
162
154
SIGNAL GENERATING AND PROCESSING CIRCUITRY
200
d
α
100
152
150
142
t
144
140
136
134
130
132
h
104
110

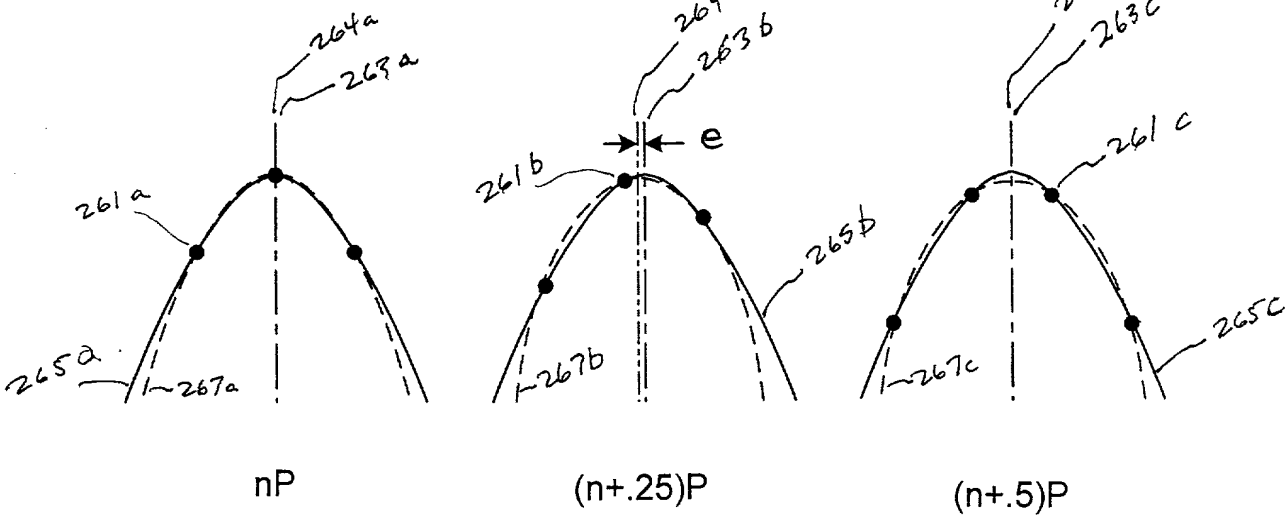
FIG. 1



Y= Multiplicative Correlation Function Value
(arbitrary units)

X = Displacement (in unit of μm)
X = Displacement (in unit of P)

Fig. 2



nP (n+.25)P (n+.5)P

Fig. 3 Fig. 4 Fig. 5

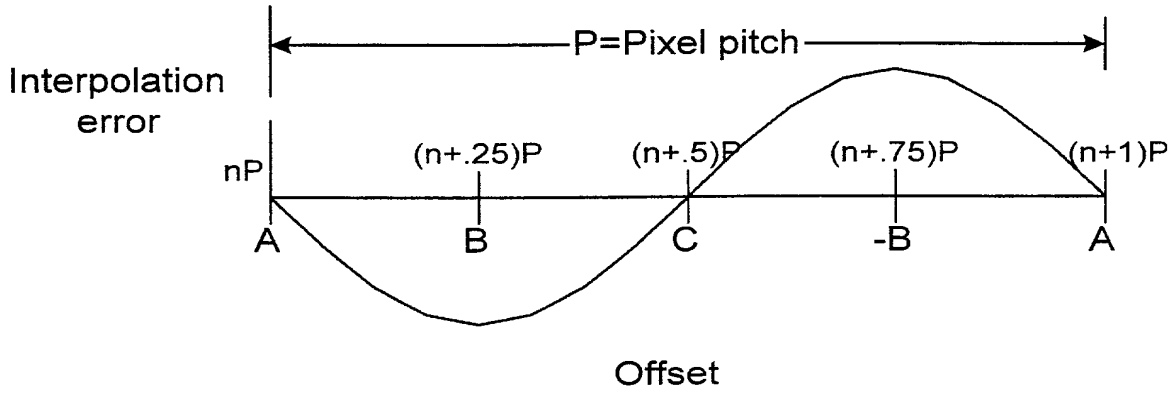
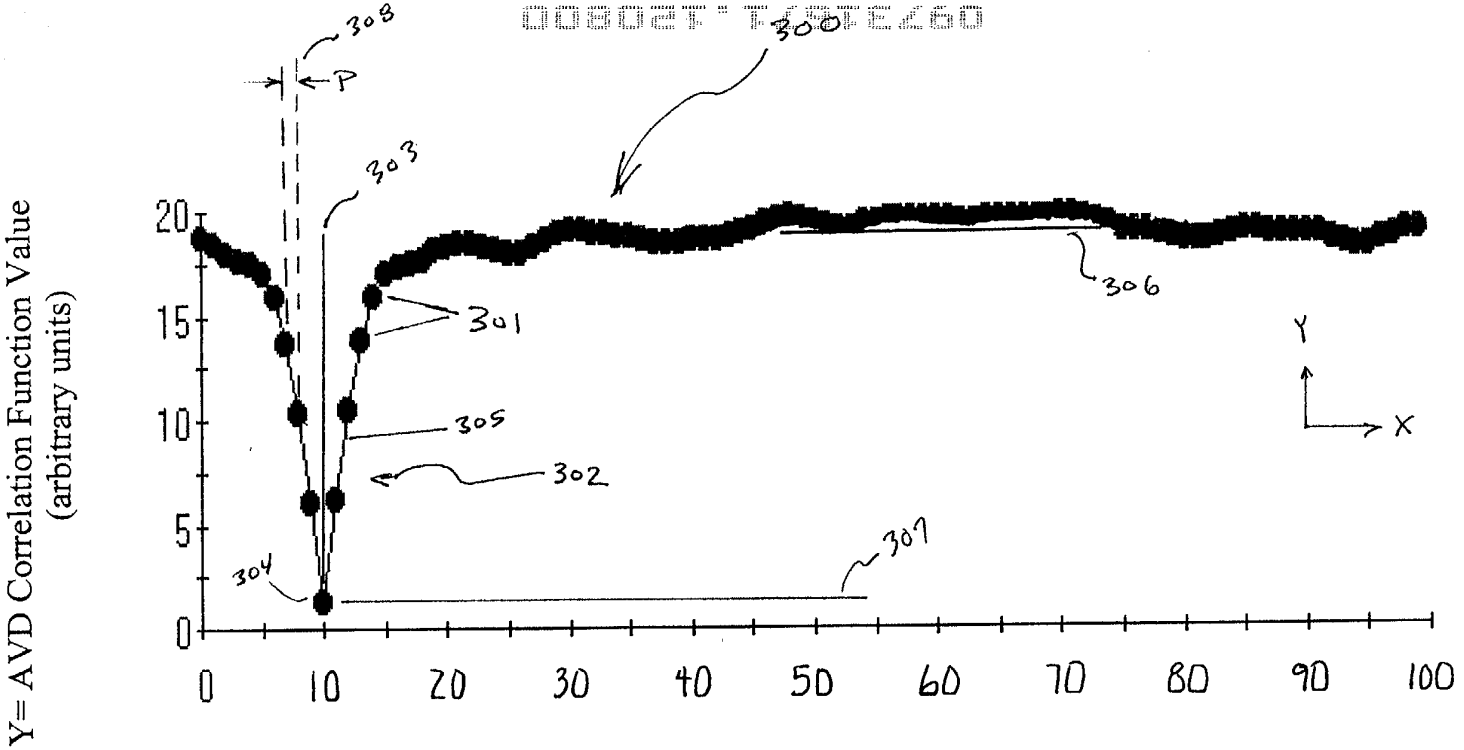


Fig. 6



X = Displacement (in unit of μm)
X = Displacement (in unit of P)

Fig. 7

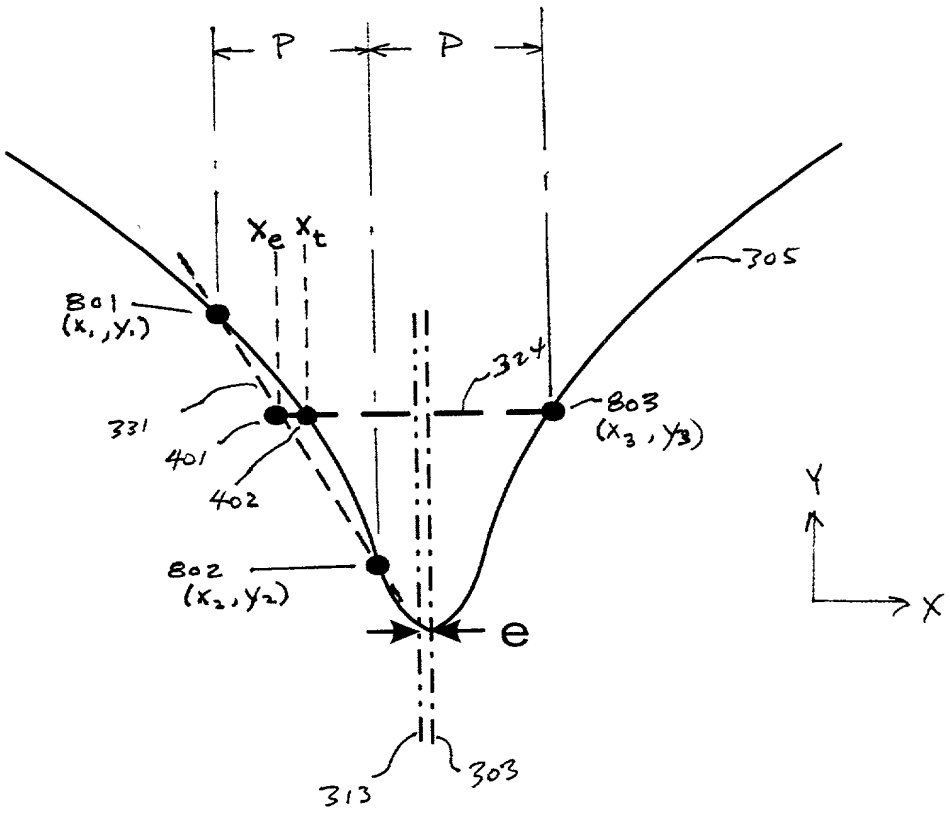


Fig. 8

DOCKET: P-3612-PCT

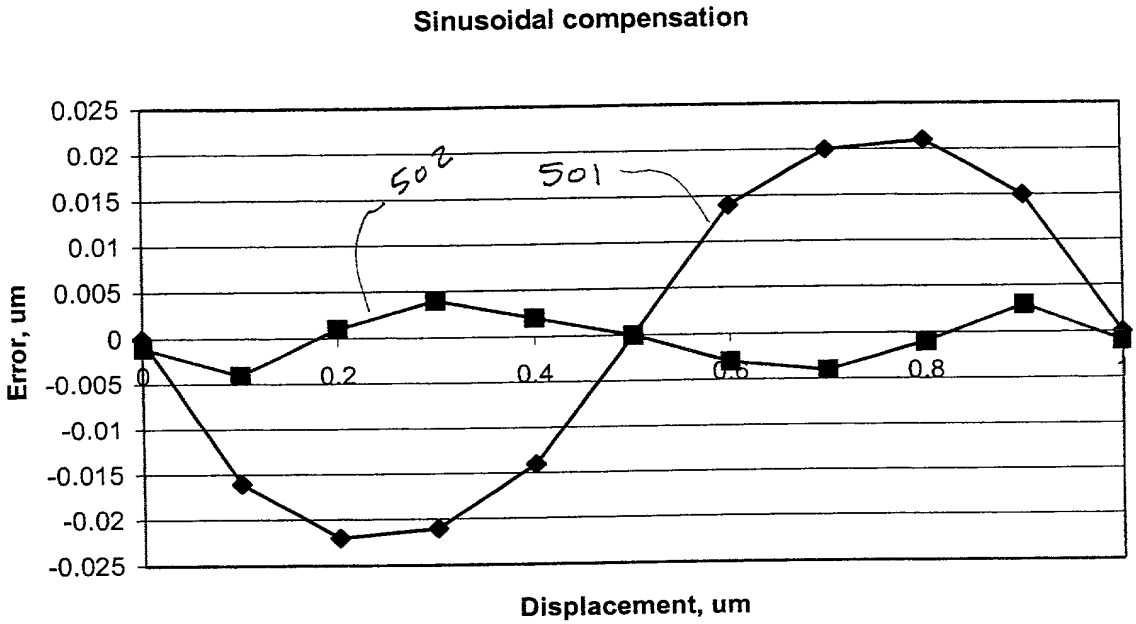

Sinusoidal compensation
0.025
0.02
0.015
0.01
0.005
0
-0.005
-0.01
-0.015
-0.02
-0.025
Error, um
0
0.2
0.4
0.6
0.8
502
501
Displacement, um

Fig. 9

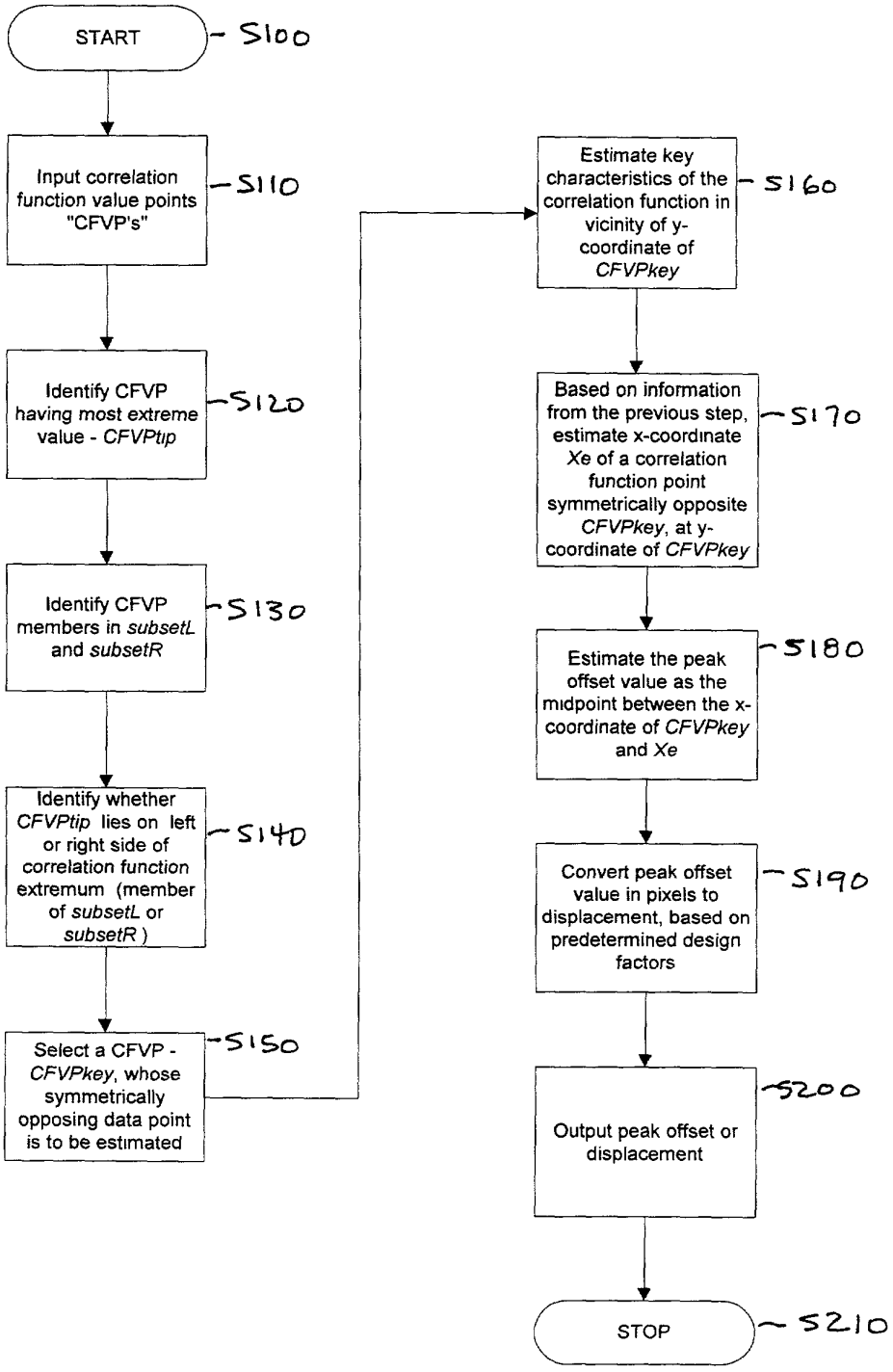

START
S100
Input correlation function value points "CFVP's"
S110
Identify CFVP having most extreme value - CFVPtip
S120
Identify CFVP members in subsetL and subsetR
S130
Identify whether CFVPtip lies on left or right side of correlation function extremum (member of subsetL or subsetR)
S140
Select a CFVP - CFVPkey, whose symmetrically opposing data point is to be estimated
S150
Estimate key characteristics of the correlation function in vicinity of y-coordinate of CFVPkey
S160
Based on information from the previous step, estimate x-coordinate Xe of a correlation function point symmetrically opposite CFVPkey, at y-coordinate of CFVPkey
S170
Estimate the peak offset value as the midpoint between the x-coordinate of CFVPkey and Xe
S180
Convert peak offset value in pixels to displacement, based on predetermined design factors
S190
Output peak offset or displacement
S200
STOP
S210

Fig. 10

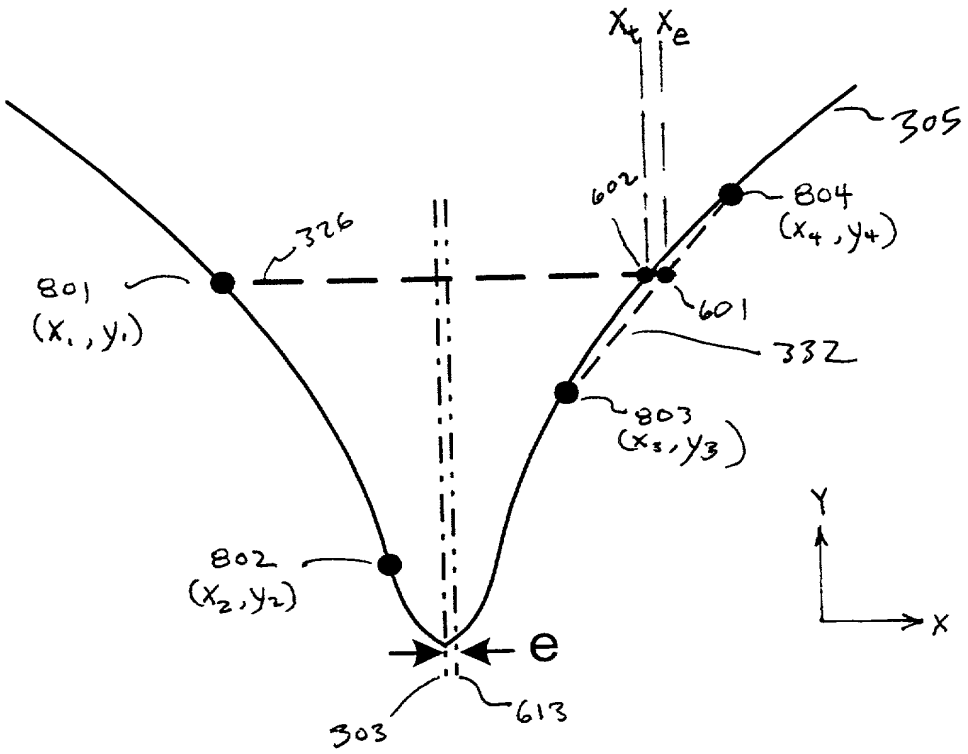

X_t X_e
305
602
804
(x_4, y_4)
326
801
(x_1, y_1)
601
332
803
(x_3, y_3)
Y
802
(x_2, y_2)
X
e
303
613

Fig. 11

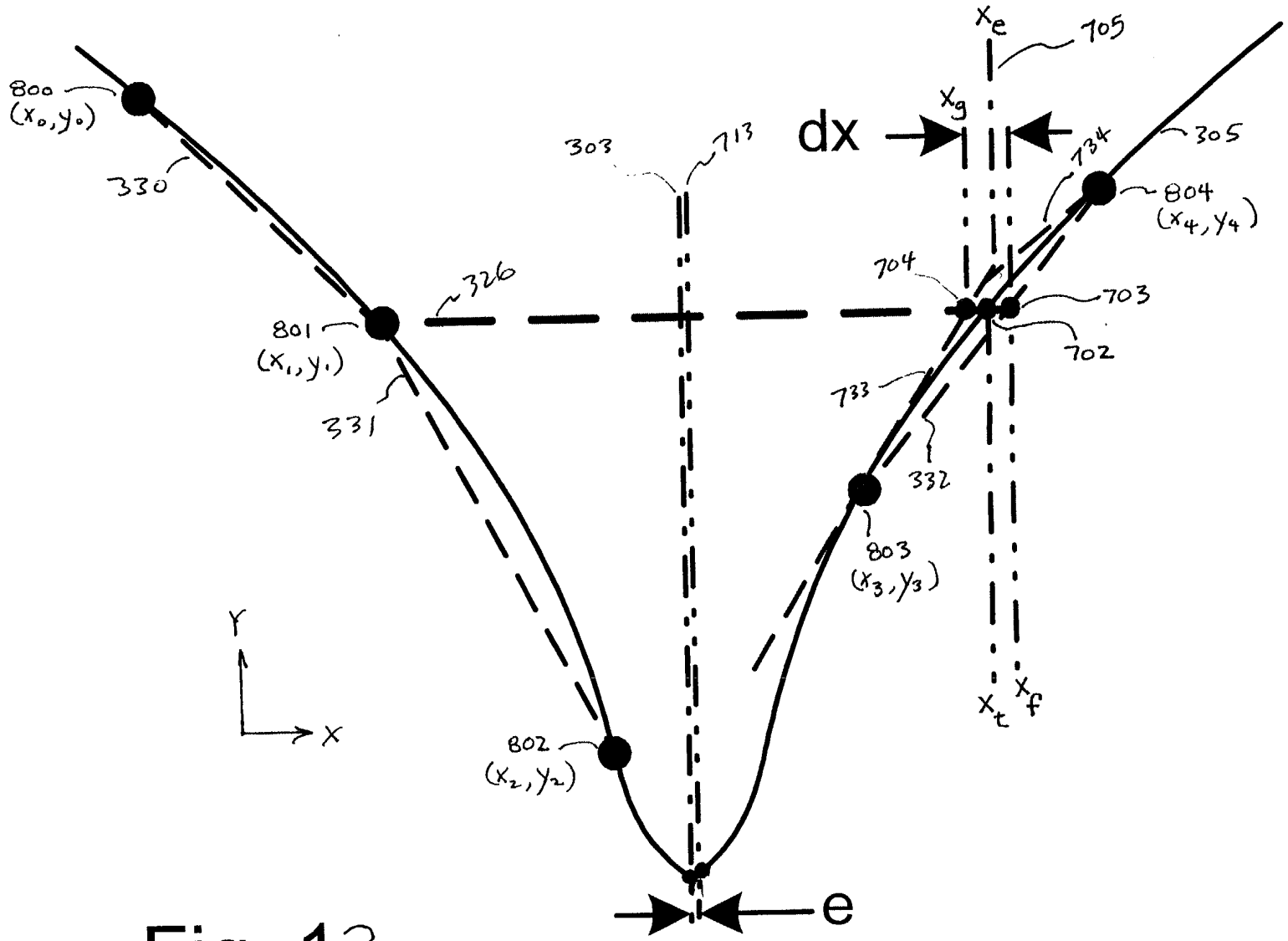

800
(x_0, y_0)
330
303
713
dx
x_e
705
x_g
134
305
804
(x_4, y_4)
704
703
702
326
801
(x_1, y_1)
331
733
332
803
(x_3, y_3)
Y
X
802
(x_2, y_2)
x_t
x_f
e

Fig. 12

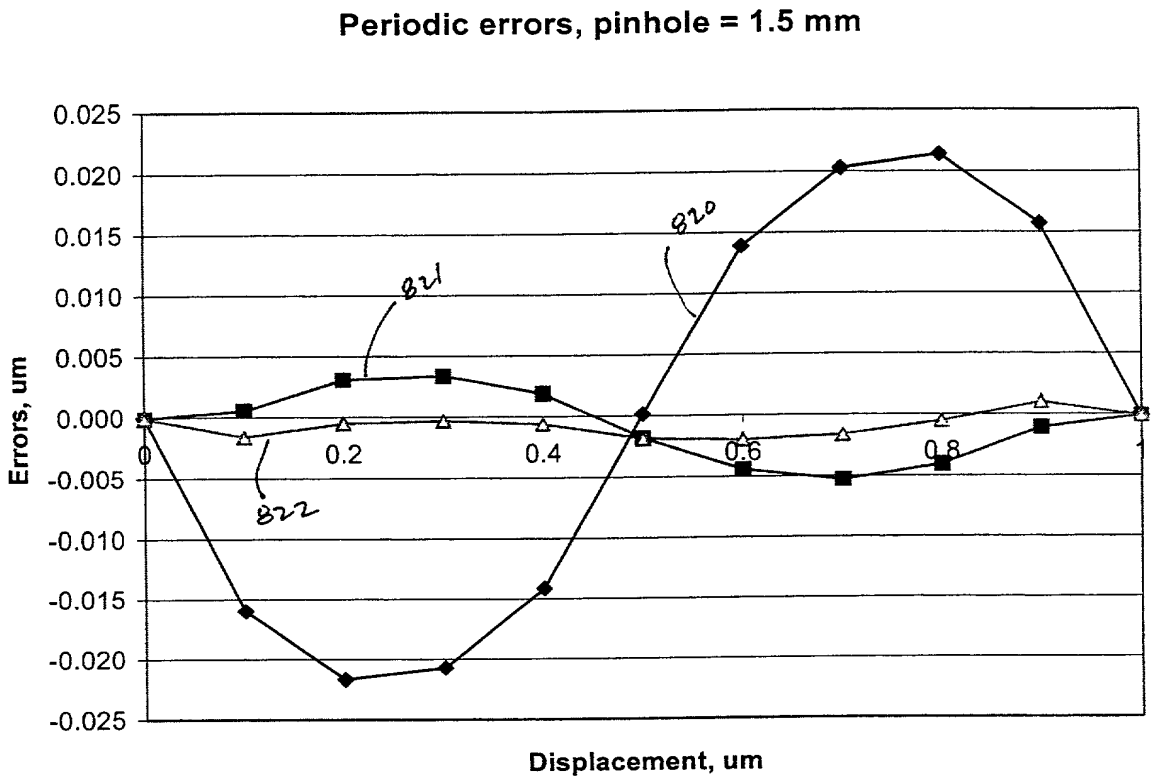

Periodic errors, pinhole = 1.5 mm
0.025
0.020
0.015
0.010
0.005
0.000
-0.005
-0.010
-0.015
-0.020
-0.025
Errors, um
0
0.2
0.4
0.6
0.8
820
821
822
Displacement, um

Fig. 13

0038021 "T2STE260

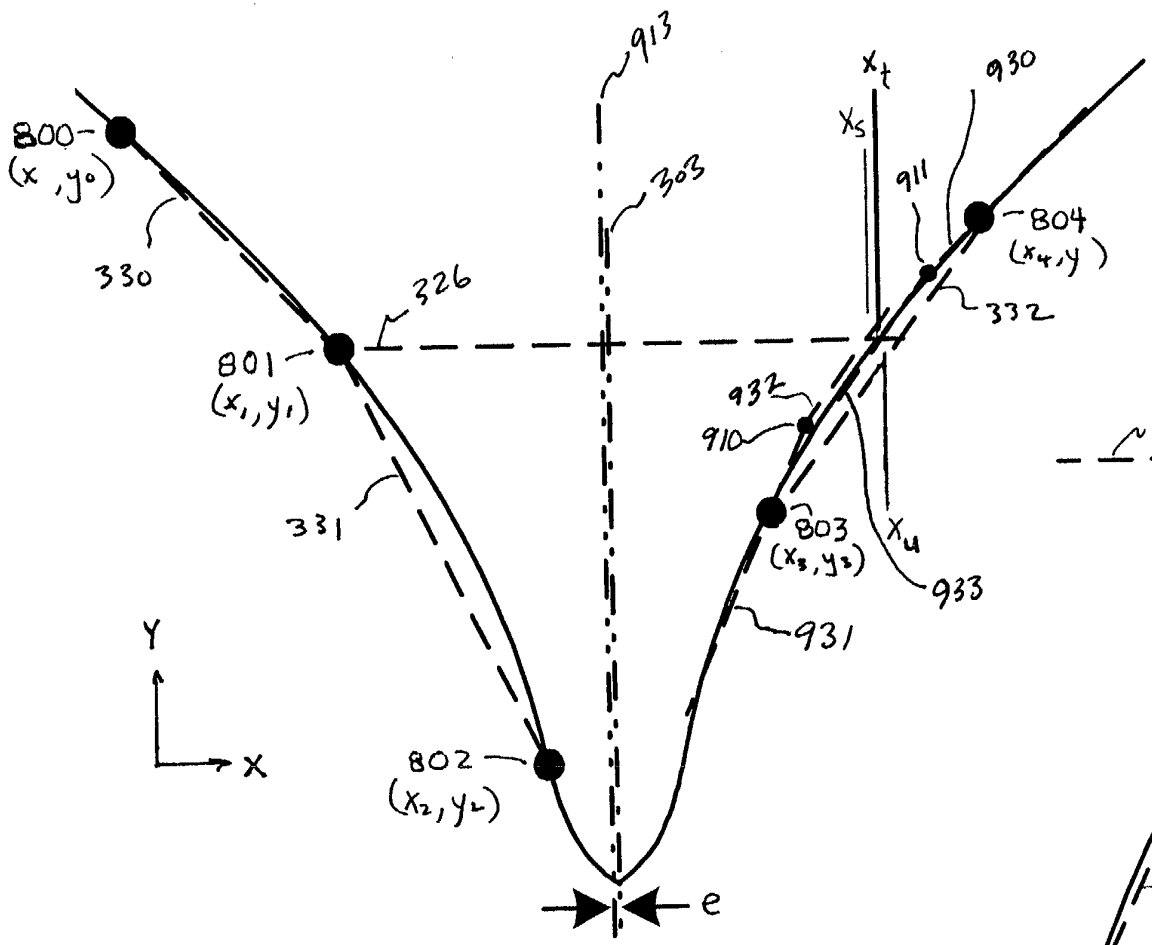


Fig. 14

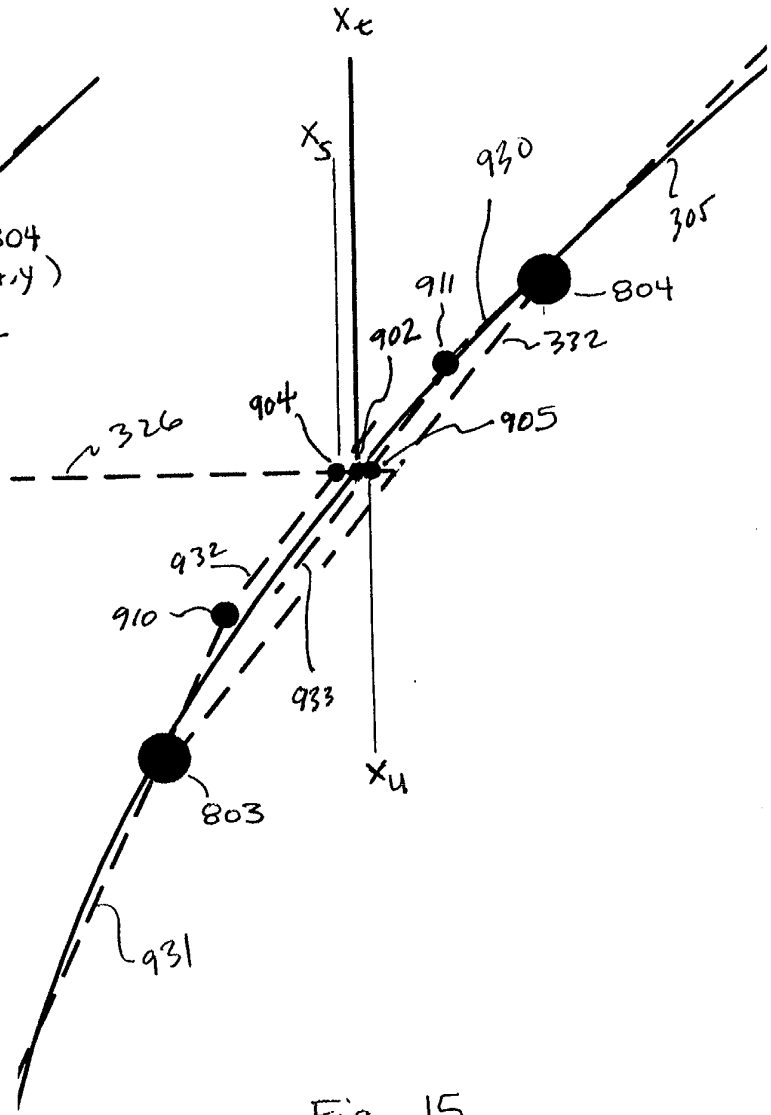


Fig. 15

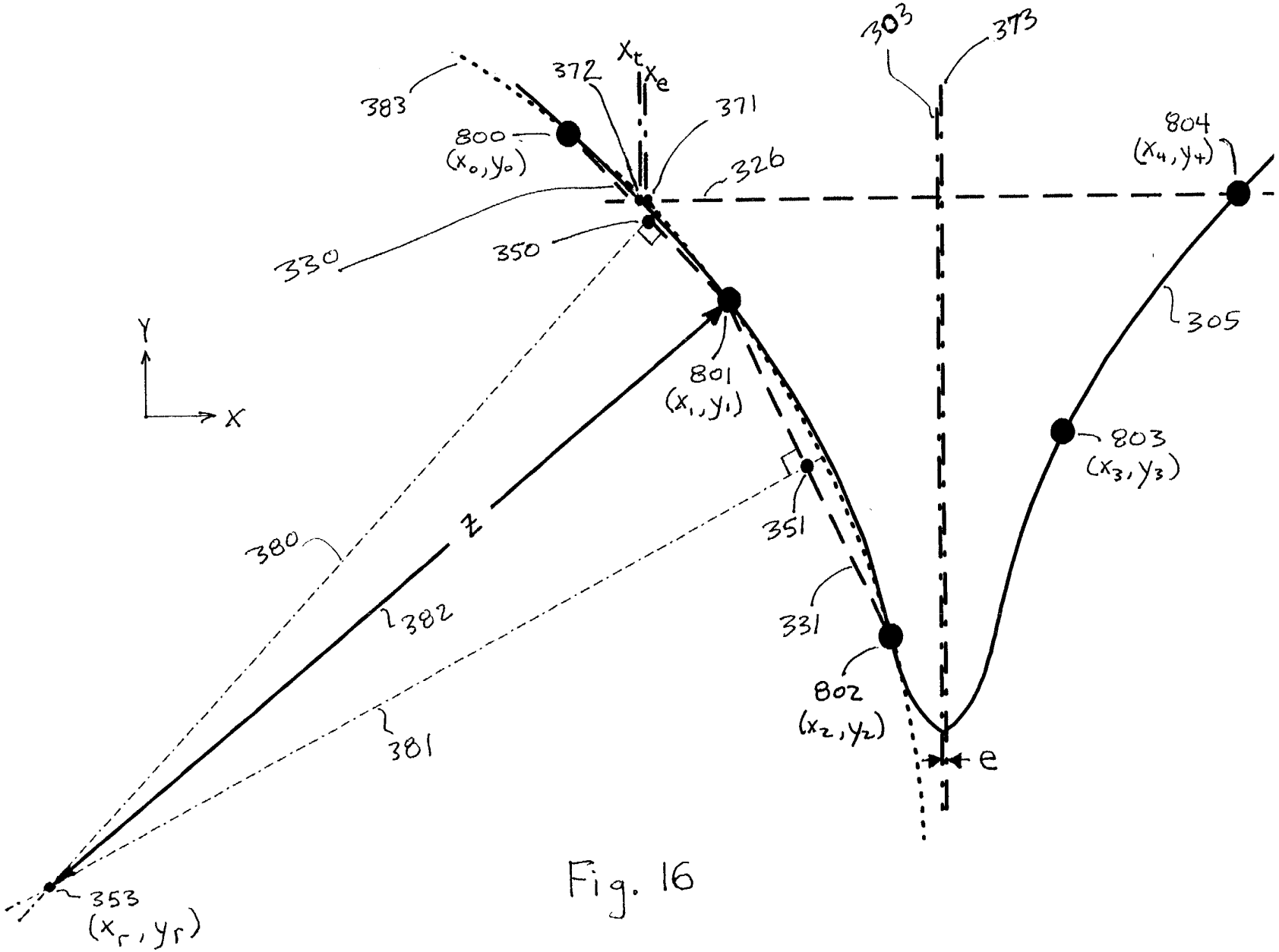

383
372
x_t
x_e
371
303
373
800
(x_0, y_0)
326
804
(x_4, y_4)
330
350
305
Y
X
801
(x_1, y_1)
803
(x_3, y_3)
351
380
Z
382
331
802
(x_2, y_2)
381
e
353
(x_r, y_r)

Fig. 16

DOCKET TESTED

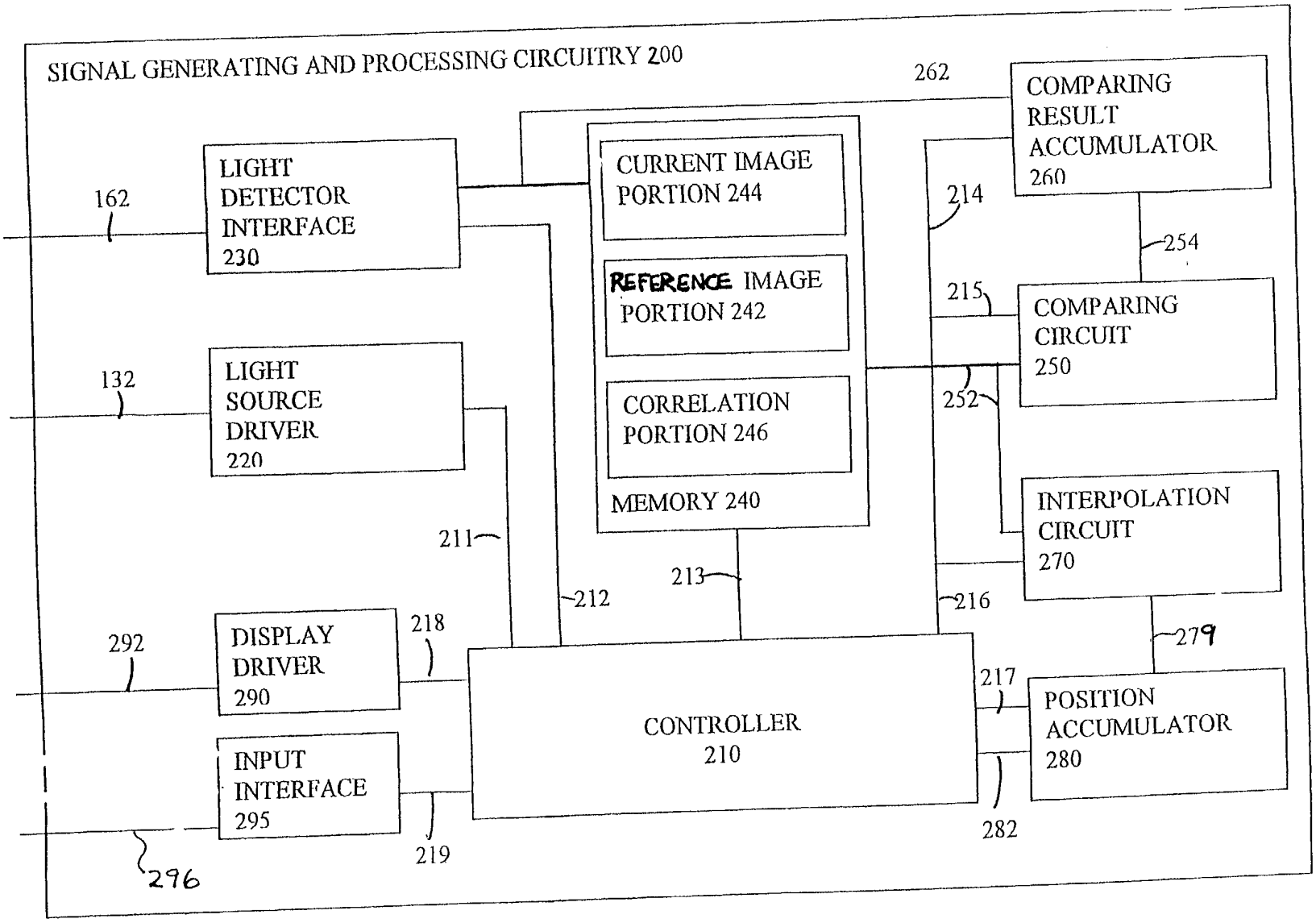


FIG. 17

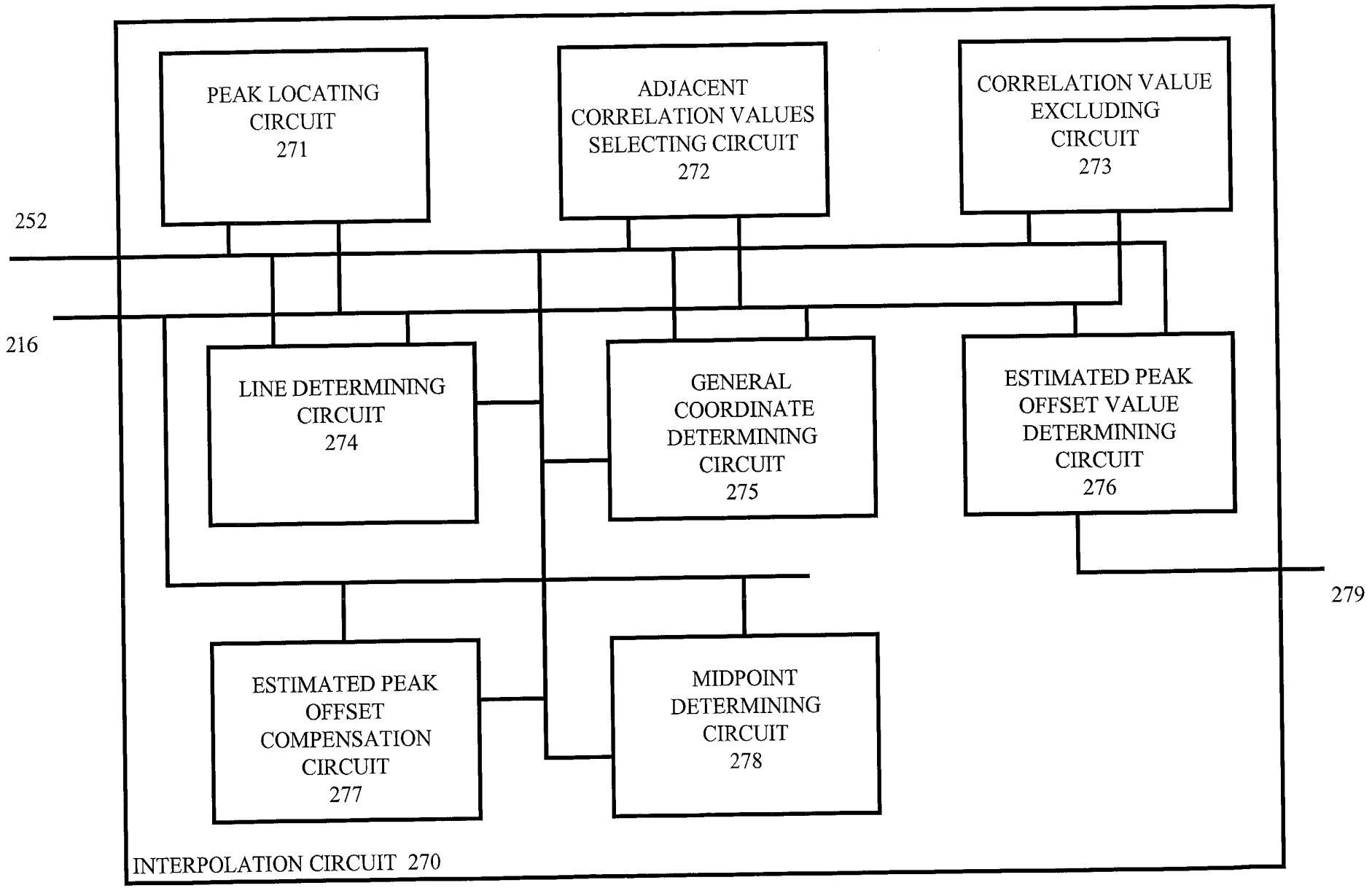

PEAK LOCATING CIRCUIT 271
ADJACENT CORRELATION VALUES SELECTING CIRCUIT 272
CORRELATION VALUE EXCLUDING CIRCUIT 273
252
216
LINE DETERMINING CIRCUIT 274
GENERAL COORDINATE DETERMINING CIRCUIT 275
ESTIMATED PEAK OFFSET VALUE DETERMINING CIRCUIT 276
279
ESTIMATED PEAK OFFSET COMPENSATION CIRCUIT 277
MIDPOINT DETERMINING CIRCUIT 278
INTERPOLATION CIRCUIT 270

FIG. 18

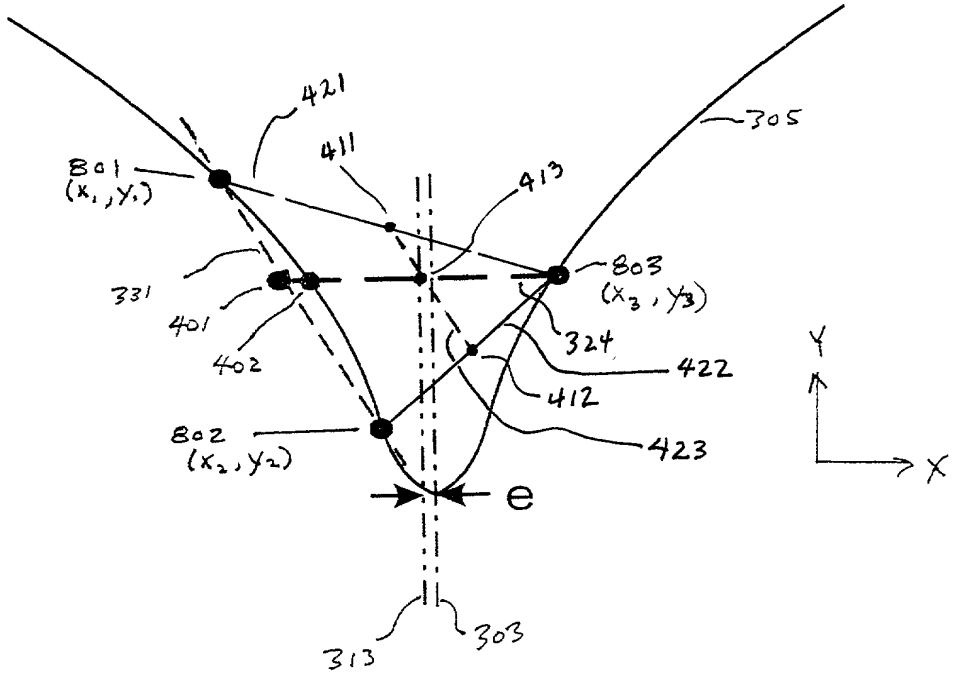


Fig. 19

DOCKET: P-5162760

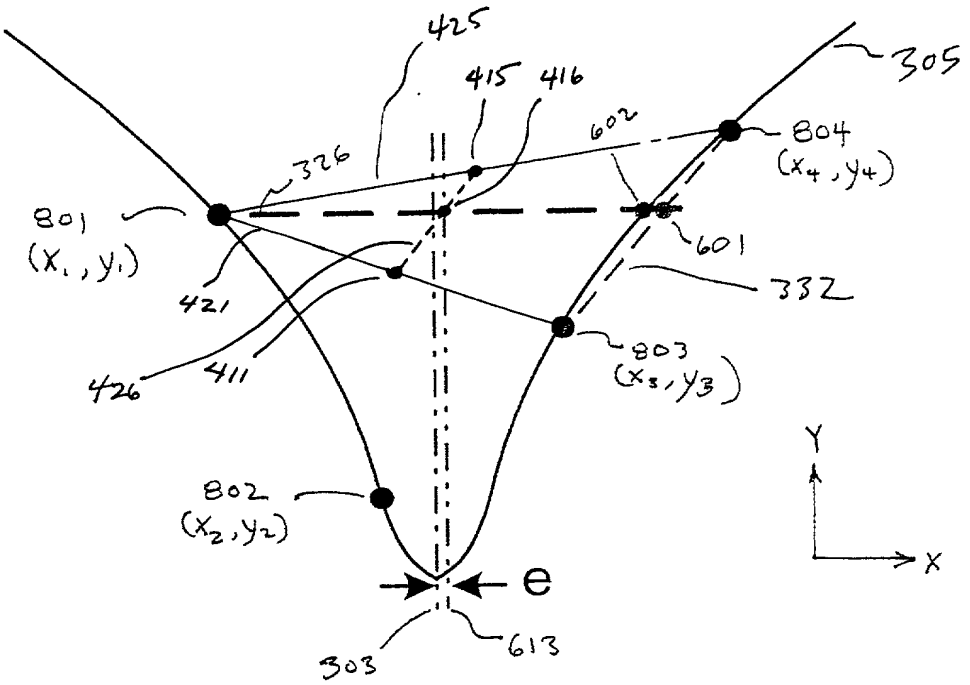

425
415
416
305
602
804
(x_4, y_4)
326
801
(x_1, y_1)
601
332
421
426
411
803
(x_3, y_3)
Y
802
(x_2, y_2)
X
e
303
613

Fig. 20